IN THE CLAIMS

Complete listing of the claims:

1. (Currently amended) A method of forming an insulating film in a semiconductor device, the method comprising:

sequentially repeating a plurality of times:

forming a partial insulating film, wherein the partial insulating film has a thickness A ~~in the range of 0.3 to 2 nm~~satisfying the relationship $0.3\ nm \leq A < 2\ nm$; and

removing impurities from the partial insulating film, wherein the removing impurities is performed at a temperature greater than 500°C;

wherein the removing impurities comprises removing residual carbon.

2. (Previously presented) The method of claim 1, wherein the removing impurities is performed in a reducing gas atmosphere or an oxidizing gas atmosphere.

3. (Previously presented) The method of claim 1, wherein the removing impurities comprises:

removing impurities in a first treatment in a reducing gas atmosphere; and

removing impurities in a second treatment in an oxidizing gas atmosphere.

4. (Previously presented) The method of claim 2, wherein the reducing gas atmosphere comprises an ammonia gas, a hydrogen gas and an inert gas, a combination comprising at least one of the foregoing gases, or plasma nitrogen, or the reducing gas atmosphere is formed in a vacuum.

5. (Previously presented) The method of claim 2, wherein the oxidizing gas atmosphere comprises an oxygen gas, a nitrogen monoxide gas, a nitrous oxide gas, an ozone gas, or a combination comprising at least one of the foregoing gases, or plasma oxygen.

6. (Previously presented) The method of claim 3, wherein the reducing gas atmosphere

comprises an ammonia gas, a hydrogen gas, an inert gas, or a combination comprising at least one of the foregoing gases, or plasma nitrogen, or the reducing gas atmosphere is formed in a vacuum.

7. (Previously presented) The method of claim 3, wherein the oxidizing gas comprises an oxygen gas, a nitrogen monoxide gas, a nitrous oxide gas, an ozone gas, or a combination comprising at least one of the foregoing gases, or plasma oxygen.

8. (Previously presented) The method of claim 1

wherein the partial insulating film has a thickness in the range of 0.5 to 2 nm.

9. (Currently amended) A method of forming an insulating film in a semiconductor device, the method comprising:

sequentially repeating a plurality of times:

forming a partial insulating film, wherein the partial insulating film has a thickness A satisfying the relationship $0.3\ nm \leq A < 2\ nm$~~in the range of 0.3 to 2 nm~~; and

removing impurities from the partial insulating film, wherein the removing impurities is performed at a temperature greater than 500°C;

wherein the removing impurities comprises:

removing impurities in a first treatment in a reducing gas atmosphere; and

removing impurities in a second treatment in an oxidizing gas atmosphere; and

the removing impurities comprises removing residual carbon.

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13. (Previously presented) The method of claim 1, wherein the removing impurities comprises desorbing CO_2.

14. (Previously presented) The method of claim 1, wherein the removing impurities comprises desorbing CO_2, CH_4 ,C_2H_6, or a combination comprising at least one of the foregoing gases.

15. (Previously presented) The method of claim 1, wherein the forming the partial insulating film comprises depositing a precursor, wherein the precursor is an Al precursor, an Hf precursor, or a combination comprising at least one of the foregoing precursors.

16. (Previously presented) The method of claim 15, wherein the precursor is trimethyl aluminum, tetrakis(dimethylamino)hafnium, or a combination comprising at least one of the foregoing precursors.

17. (Previously presented) The method of claim 15, wherein water vapor is used as an oxidant for the precursor in the forming the partial insulating film.

18. (Previously presented) The method of claim 9, wherein the oxidizing gas comprises an oxygen gas, a nitrogen monoxide gas, a nitrous oxide gas, an ozone gas, or a combination comprising at least one of the foregoing gases, or plasma oxygen.

19. (Previously presented) The method claim 9, wherein sequentially repeating a plurality of times comprises sequentially repeating three times.

20. (Previously presented) The method claim 16, wherein sequentially repeating a plurality of times comprises sequentially repeating eight times.

21. (Currently amended) A method of forming an insulating film in a semiconductor device, the method comprising:

sequentially repeating a plurality of times:

forming a partial insulating film by atomic layer deposition employing an Al precursor, an Hf precursor, or a combination comprising at least one of the foregoing precursors, while employing water vapor gas as oxidant, wherein the

partial insulating film has a thickness A satisfying the relationship 0.3 nm ≤ A < 2 nm~~in the range of 0.3 to 2 nm~~; and

removing impurities from the partial insulating film, wherein the removing impurities is performed at a temperature greater than 500°C;

wherein the removing impurities comprises:

removing impurities in a first treatment in a reducing gas atmosphere; and

removing impurities in a second treatment in an oxidizing gas atmosphere, and

wherein the removing impurities comprises removing residual carbon.